

To Cite:

Afzal F, Aalam KP, Mehra S, Joshi S, Ahmad AA. Practice and awareness of migrant pregnant women living in urban slums towards tobacco consumption. *Medical Science* 2022; 26:ms316e2332.

doi: <https://doi.org/10.54905/disssi/v26i125/ms316e2332>

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Peer-Review History

Received: 03 June 2022

Reviewed & Revised: 05/June/2022 to 23/July/2022

Accepted: 24 July 2022

Published: 27 July 2022

Peer-review Method

External peer-review was done through double-blind method.

URL: <https://www.discoveryjournals.org/medicalscience>



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Practice and awareness of migrant pregnant women living in urban slums towards tobacco consumption

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ABSTRACT

Background: Annually, 1.35 million tobacco attributable mortalities occur in India. The problem is alarming and exacerbated in the case of migrants living in low socioeconomic conditions. Past researchers indicated migrant pregnant women are most vulnerable in this regard. **Aim:** The objective of the study is to find out the tobacco related practices and awareness of migrant pregnant females residing in the urban slums area of Aligarh city. **Method:** A cross-sectional study with a sample size of 314 was conducted. Three hypotheses were proposed based on the available evidences. Data collection was done by a pre-tested interview schedule. Awareness level was captured by scoring the responses of participants. For statistical analysis IBM-SPSS (version 22.0) was utilized. Linear regression, unpaired t-test and ANOVA methods were employed for analysis and hypothesis testing. **Results:** About one-third of the respondents consumed tobacco product in the past, out of which approximately 31% of the respondent consumed tobacco during pregnancy. The awareness score of respondents were analyzed and found to exhibit a positive linear association ($R^2=0.802$) with mass media exposure. Analysis unveiled a statistically significant variation in awareness score (regarding health impact of tobacco use) of migrant women married to tobacco consuming males (14.7 ± 2.6) and non-consuming males (23.2 ± 3.1). **Conclusion:** The government health agencies should reboot mass media campaigns against tobacco use; priority to migrants in the reproductive age group should be given. A social-network analysis needs to be done, to examine the role of husbands in imparting tobacco related awareness to wives.

Keywords: Migrants, slums, poverty, reproductive health, women empowerment, tobacco, smoking.

1. INTRODUCTION

The global burden of tobacco consumption is steadily declining. The drop in numbers of tobacco users is more prominent in developed nations as compared to developing nations. Despite the decreasing trend, tobacco

consumption is considered one of the biggest public health challenges in India. About 12% smokable tobacco users of the world reside in India and 1.35 million tobacco-attributable deaths annually in India (Chhabra et al., 2021; Ali et al., 2018). As per World Health Organization (WHO), approximately 29% of the adult Indian population consumes tobacco products in one form or another (WHO Tobacco Factsheet, 2018). There is a remarkable difference in the gender-based prevalence distribution of tobacco consumption in India, approximately 38% of males consume tobacco, whereas only 8.9% females. The data from National Family Health Survey (NFHS) revealed that prevalence of tobacco consumption varies with demographic and socioeconomic variables of the region, which is corroborated by the statistics that the proportion of females consuming tobacco in rural areas is almost double as compared to urban areas (Shah et al., 2018; NFHS-5).

The effect of tobacco consumption on reproductive health and wellbeing in general, has been researched in-depth. The detrimental impact of tobacco consumption on female reproductive health is due to hampered ovarian function, changes in ovulation and ovarian morphology (Laldinsangi, 2022). Human endometrial research has shown, tobacco use leads to cellular viability reduction and inhibits hormonal receptors, such as estrogen and progesterone receptor expressions (Totonchi et al., 2016). Further, the clinical trials have demonstrated that the constituents of smokeless tobacco decrease antioxidant defense mechanism by hampering enzyme markers, namely glutathione reductase, glutathione peroxidase etc (Khademi et al., 2019). One of the incredibly crucial ovarian functions is to regularize the menstrual cycle. Kulkarni et al., (2017) have found a statistical association between tobacco consumption and irregular menstruation. Studies have shown, tobacco consumption is associated with an increased count of ovarian cyst follicles formation (Momenimovahed et al., 2019).

Studies have reported a vast range of repercussions of tobacco and nicotine on ovarian morphology. Experiments on animals have revealed that chemicals found in tobacco leads to decrease in the weight of ovaries and lesser survival rate of ovulated oocytes (Paccola et al., 2021). Further, the ratio between healthy and abnormal follicles gets reduced, leading to reduced fertility (Setti et al., 2022). In the last two decades, many researchers have reported the impact of tobacco consumption on pregnancy outcomes. Studies involving adult pregnant females have reported that the chemicals contained in tobacco have a statistically significant association with hemoglobin level during pregnancy (Alamneh et al., 2020). This poses a risk of lower birthweight, preterm birth, and stillbirth, which further compromises the health of mother and neonate.

Studies have reported an increased risk (by 48%) of occurrence of gestational diabetes, hypertension, and miscarriage in female tobacco consumers (Chandirasekar et al., 2019). The detrimental effects are not confined to a mother but transcends to the newborn. Nordenstam et al., (2017) have found evidences that the infants born to pregnant women consuming snuff (dried tobacco) during pregnancy have abnormal heart rate variation with a risen ratio between low frequencies and high frequencies. Nicotine exposure to the offspring may occur either in the form of exposure to fetus (mother consuming tobacco during pregnancy) or as Second-hand Smoke (SHS) inhaled by children. Researchers argue, mother's tobacco consumption augments the RR (Relative Risk) of apnea and development disorders (such as, cleft palate, impaired tooth eruption and eye and ear opening deformities) in the offspring (Liu et al., 2019; Andrade et al., 2020). In case of SHS inhaled by pregnant female, it leads to reduced head circumference of the newborn and increased risk of preterm birth (Soesanti et al., 2019; Hoyt et al., 2018).

Nicotine, one of the components of tobacco, is reported for disruptive fetus development as well as growth of children (McGrath et al., 2020). Studies suggest nicotine exposure is associated with poor academic performance of children; furthermore, exposed children have higher risk of various health problems during adult life, such as neurological, endocrine, sexual, and cardiac problems (Holbrook, 2016). From a social aspect, the researcher has explored the reasons behind tobacco consumption by females. Researchers have argued that alcohol consumption, illiteracy and tobacco use by any other family member is a predisposing factor of tobacco use (Krishnamoorthy and Ganesh, 2020).

A study conducted by Ibrahim et al., (2019) reported, 88% of prevalence of tobacco use by women engaged in agricultural occupations. Socioeconomic surveys have reported, the prevalence and risk of indulging in smokable tobacco consumption is higher in those females who belong to medium wealth section. However, the prevalence of chewable tobacco products is higher in the poor females having low standard of living (Thakur and Paika, 2018). It was reported that there exists a positive correlation between age of women and prevalence of tobacco abuse. Further, it was found that the RR of tobacco related diseases is higher in case of females as compared to males. For instance, RR of oropharyngeal cancer for women was reported to be 14.56, whereas for men it was 7.44 (Mishra et al., 2012). Ever since the advent of the COVID era, it has been established that the technology plays a pivotal role in information dissemination to masses and developing awareness (Afzal et al., 2020). However, the low socioeconomic population is deprived of technologically aided healthcare and information sources.

Studies have reported the population below poverty line are already vulnerable and face many challenges related to health (Afzal et al., 2021). The situation gets exacerbated in case of female migrants in patriarchal society (Thorat et al., 2018; Mishra et al., 2020; Sadhu et al., 2020). Considering migration as a social phenomenon, few studies have been carried out for finding an

association between migration and tobacco consumption. The general trend suggests, migrants have higher proclivity towards tobacco use and the prevalence varies geographically. A study on migrant laborers of both genders in an urban area of Kerala province revealed that the prevalence of tobacco use is 41% and out of which 36% participants have oral-mucosal lesions (Aslesh et al., 2015).

In a study conducted in Chennai on migrant construction workers, it was found that the proportion of tobacco consumers was dramatically high (98%) regardless of the high level of awareness in the participants (Tirukkovalluri et al., 2020). Another study conducted in Pondicherry revealed, the prevalence of tobacco consumption is 60% among migrant workers (Kumar et al., 2021). From the aforementioned discussion, it is established that the migrant population, females and low socioeconomic groups of population are vulnerable groups, and when combined altogether, migrant pregnant females from low socioeconomic status are the most vulnerable section. A review of past studies suggested the impact of tobacco consumption on female reproductive health is extensively researched. However, there is lack of research analyzing the tobacco consumption pattern of migrant pregnant females from low socioeconomic section of society. Further, there exists a knowledge gap regarding awareness level of this group about tobacco consumption. For the closure of these knowledge gaps, in the present study, migrant pregnant women having low standard of living are surveyed.

The objective of the present study is to analyze the tobacco related practices and awareness of migrant pregnant females residing in the selected urban slums (Jeevagarh and Firdaus Nagar) of Aligarh district of Uttar Pradesh. The present study has also tried to draw an association between Body Mass Index (BMI) and tobacco related awareness. Standardized WHO classification of BMI into three categories was considered and participants were categorized into low BMI ($<18.5 \text{ kg/m}^2$), normal BMI ($18.5\text{--}24.9 \text{ kg/m}^2$) and high BMI ($>25 \text{ kg/m}^2$). Three hypotheses are proposed to meet the goals of the study; (i) Hypothesis 1- There is an association between tobacco related awareness and mass media exposure. (ii) Hypothesis 2- There is a difference in awareness level of women married to males who consume tobacco and those who don't consume tobacco. (iii) Hypothesis 3- There is difference in the average awareness level of pregnant females with low BMI, normal BMI, and high BMI.

2. METHODOLOGY

A cross-sectional descriptive study was conducted from 1st December 2021 to 31st March 2022. The study was conducted at JN Medical College, Aligarh. Pregnant women coming from any of the two urban slums for checkup in Obstetrics & Gynecology Department of JN Medical College were contacted and invited to participate. The point of contact was the Ultrasonography (USG) unit of the Radiology & Imaging Department. Using the Cochran's formula, sample size determination was done, where 5.4% prevalence of tobacco consumption was considered (NFHS-5), at a confidence level of 95% with margin of error 2.5%. The total sample size was 314. Samples were drawn using inverse probability sampling. One random number 1 to 10 was generated by computer, for interval determination between sample selections. Every 3rd woman coming for USG was contacted and invited to participate. In case of refusal or not fulfilling the sampling criteria, the next in-line woman was invited to participate.

Sampling Criteria

Women between the age 15 to 49 years, who are migrants in the city and living in any one of the urban slums, were included. Even though the legal marriage age for females in India is 18 years, there is a trend of child marriage and early marriage in low socioeconomic cohort (Paul, 2020). Further, as per WHO, the standardized reproductive age of females starts at 15 years. Hence, the lower age limit is considered as 15 years instead of 18 years.

For data collection, a questionnaire was developed based on various variables identified from past literature. The pilot testing and validation of the questionnaire was conducted, and required modifications were made in the tool. Questionnaire consisted of questions, which were grouped into 3 parts (i) demographic aspect, (ii) tobacco consumption habit and (iii) awareness of respondent regarding effect of tobacco use on health and wellbeing. The questions were multiple choices and close ended. For the purpose of statistical analysis, participants were scored based on the third part of questionnaire (awareness part), containing 30 questions. Interviews were conducted by a trained female investigator. Data entry was done in CS-Pro (version 7.3).

For statistical analysis, IBM-SPSS® (version 22.0) was utilized. For analysis and hypothesis testing linear regression, unpaired t-test and ANOVA were employed.

3. RESULTS

Demographics Profile

The mean age of the respondents was 27.5 ± 4.2 years. Majority of the respondents (49%) were intra-state migrants from other parts of Uttar Pradesh, followed by Bihar and Jharkhand, 21% and 15% respectively. Majority of the respondents (64%) belong to Islam religion, followed by Hinduism (29%). Most of the respondents (55%) were illiterate, followed by 26% respondents who had no formal schooling but were able read or write (elementary level). Only 19% of respondents had formal schooling and able to read or write. Dramatically high portion of respondents (87%) were earning monthly income less than ₹ 10000. Data revealed that 61% of respondents migrated due to marriage and have husband already living in Aligarh district, whereas 36% reported they migrated after marriage for economic actives (work and business). Majority of the respondents (43%) were in 2nd trimester, followed by 1st and 3rd trimester, 21% and 36% respectively.

Tobacco related practices

Data revealed a significant portion of respondents 32% (n=102) ever consumed tobacco products, and 68% respondents never consumed. Among those who have ever consumed tobacco, 31% (n=32) were consuming tobacco during pregnancy, whereas 69% (n=70) quit tobacco just before or after pregnancy detection. Respondents who use tobacco now or in the past were asked to choose one or more products they usually consume. Data revealed 19% respondents were consuming both smokeless and smokable forms of tobacco, whereas any one form of tobacco, either smokeless or smokable tobacco is consumed by 55% and 26%, respectively. The frequency count of various tobacco products consumed by respondents revealed that 'Guthka', a chewable form of tobacco, is the most prevalent among tobacco consumer respondents. It is also the most consumed smokeless tobacco product, selected by 41 respondents. Bidi is the most used among smokable forms of tobacco (figure 1). Responses regarding the use of tobacco (in past or currently using) were analyzed based on demographic variables (table 1).

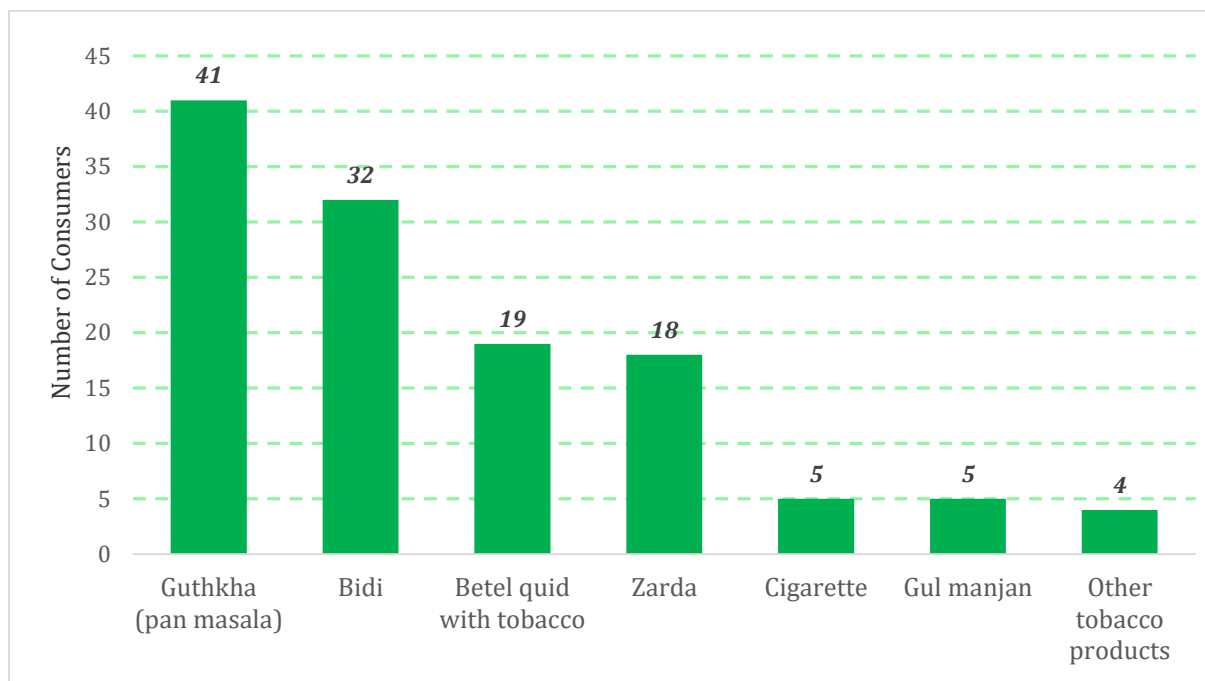


Figure 1 Number of participants consuming different types of tobacco products.

Table 1 Association between demographic variable and tobacco consumption

Variables	Tobacco consumed ever		χ^2	P value
	Yes (N=102), n (%)	No (N=212), n (%)		
Age group				
15-19	7 (38.9)	11 (61.1)	2.01	0.91
20-24	25 (30.1)	58 (69.9)		

25-29	53 (33.3)	106 (66.7)		
30-34	10 (28.6)	25 (71.4)		
35-39	4 (40.0)	6 (60.0%)		
40-44	2 (50.0)	2 (50.0%)		
45-49	1 (20.0%)	4 (80.0%)		
Type of family				
Nuclear	70 (48.3)	75 (51.7)	30.63	< 0.001*
Joint	32 (18.9)	137 (81.0)		
Husband's Occupation Type				
Skilled	19 (17.1)	92 (82.9)	35.77	< 0.001*
Semi-skilled	25 (26.3)	70 (73.7)		
Unskilled	58 (53.7)	50 (46.3)		
Migrated from				
Bihar	36 (54.4)	30 (45.6)	65.60	< 0.001*
Jharkhand	32 (68.1)	15 (31.9)		
Haryana	3 (15.8)	16 (84.2)		
Delhi NCR	1 (5.3)	18 (94.7)		
Within State (other parts of Uttar Pradesh)	29 (18.8)	125 (81.2)		
Any other	1 (11.1)	8 (88.9)		
Literacy Status				
Illiterate	47 (27.3)	125 (72.7)	11.51	0.003*
No formal schooling but able read or write	39 (47.6)	43 (52.4)		
Literate with formal schooling	16 (26.7)	44 (73.3)		
Religion				
Islam	88 (43.8)	113 (56.2)	33.34	< 0.001*
Hinduism	13 (14.3)	78 (85.7)		
Sikh	1 (6.3)	15 (93.8)		
Christian	0 (0.0%)	3 (100.0)		
Others	0 (0.0%)	3 (100.0)		
Caste				
General	48 (25.8)	138 (74.2)	9.75	0.020*
Scheduled caste	33 (44.6)	41 (55.4)		
Scheduled tribe	6 (40.0)	9 (60.0)		
Other backward class	15 (38.5)	24 (61.5)		
Main Reason of Migration				
Marriage	55 (28.5)	138 (71.5)	8.44	0.024*
Employment	39 (44.3)	49 (55.7)		
Business	7 (26.9)	19 (73.1)		
Others	1 (14.3)	6 (85.7)		

*Chi squared test was conducted where statistical significance at p -value < 0.05.

On the basis of age groups, data analysis does not reveal any specific trend or association with tobacco consumption. About 48% of all the respondents currently having a nuclear family reported having consumed tobacco in the past or currently consuming it. However, the proportion of women who ever consumed tobacco was significantly lower in case of respondents currently having a joint family. The proportion of respondents who ever consumed tobacco was significantly higher (54%) in case their husband engaged in unskilled work, whereas dramatically lower (19%) in respondents married to skilled workers. Respondents migrated from Jharkhand and Bihar, have a higher proportion of tobacco users, approximately 68% and 54% respectively. About 29% of the respondents originated from other parts of Uttar Pradesh are current tobacco users or have consumed in the past.

Respondents grouped on the basis of literacy status revealed that, 27% of illiterate respondents are tobacco users, whereas literate respondents with formal education have 26%. Respondents with no formal schooling (but able to read or write) had higher proportion of tobacco users 47%. Analysis based on religious background revealed that respondents following Islam (Muslim) have significantly highest proportion of tobacco users as compared to the rest of the religion category. The respondents belonging from unreserved caste have lower proportion of tobacco users in comparison to reserved categories (ST, SC and OBC). Group of respondents who migrated due to matrimony have lower proportion of tobacco users (28%), whereas those who migrated for economic activity (employment or business) have a significantly higher proportion of tobacco users (40%).

For analyzing association between tobacco related awareness and mass media exposure, linear correlation and regression analysis was conducted. The awareness score was found to exhibit a positive linear association ($R^2=0.802$) with number of hours of weekly exposure to mass media. Hence, hypothesis 1 is accepted (figure 2).

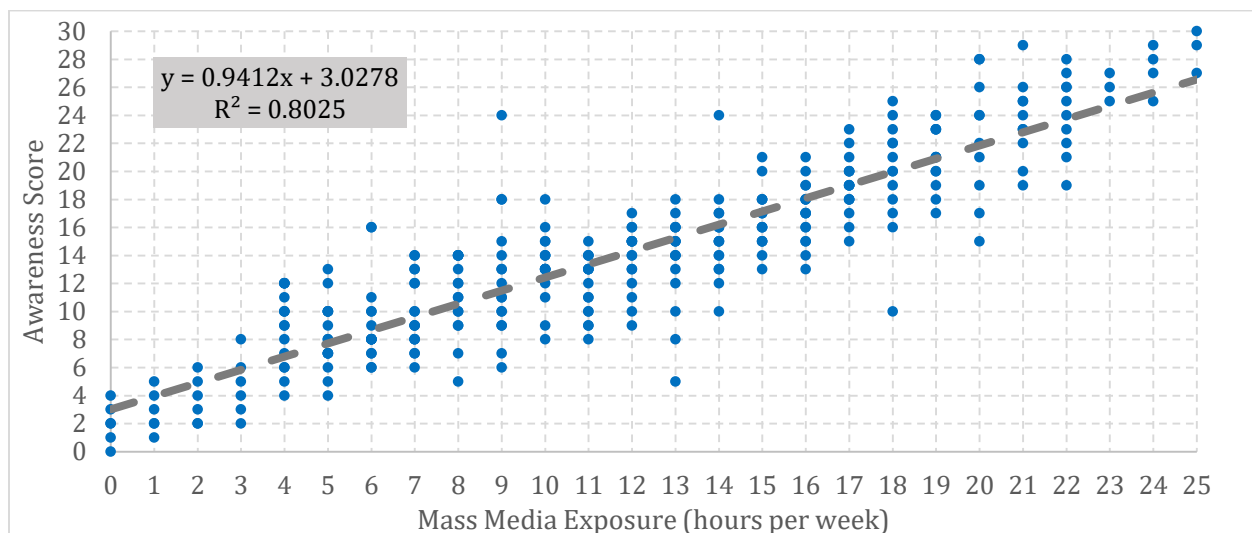


Figure 2 Association between tobacco related awareness and mass media exposure.

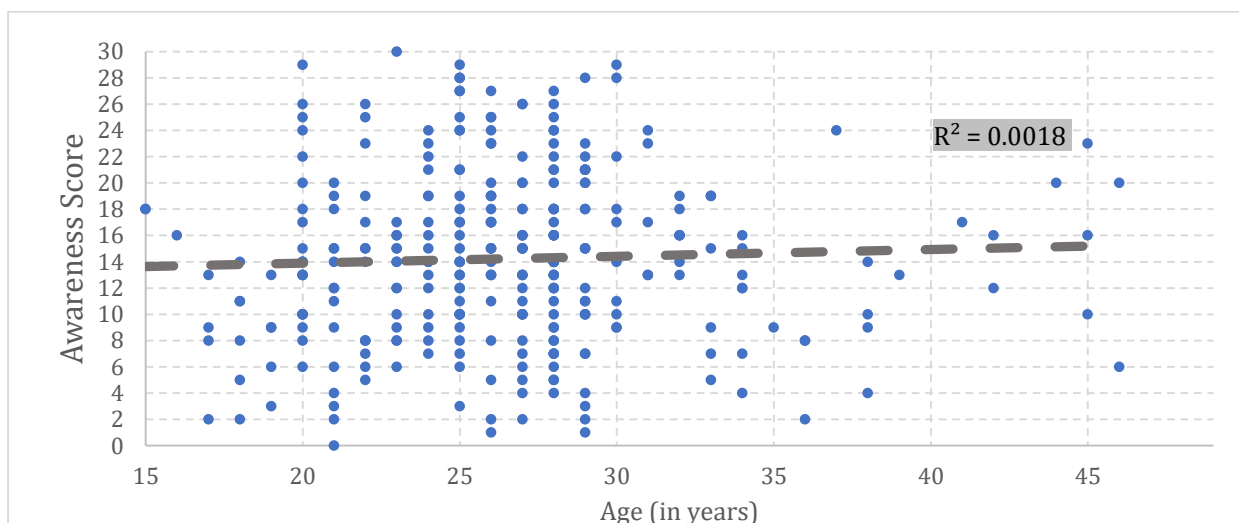


Figure 3 Association between tobacco related awareness and respondent's age.

Similarly, the awareness score was analyzed based on the age of the respondents. Linear regression revealed no association ($R^2=0.0018$) between the age and awareness score (figure 3).

The average awareness of respondents married to tobacco consumers was found to be lower than the respondents married to non-consumers. Further, independent t-test analysis revealed a difference in awareness score (regarding health impact of tobacco use) of migrant women married to tobacco consuming males (14.7 ± 2.6) and non-consumers males (23.2 ± 3.1), with statistical significance ($p\text{-value}=0.02$). The result suggests, husband's tobacco consumption status is a governing factor for wife's awareness regarding tobacco's impact on health. Hence, hypothesis 2 is accepted.

For analyzing the variation of tobacco usage effect related awareness of respondents on the basis of nutritional status, BMI was taken as a variable. From the anthropometric data available in the medical records, the BMI of all respondents were calculated and grouped into 3 groups namely, Low BMI ($<18.5 \text{ kg/m}^2$), Normal BMI ($18.5\text{--}24.9 \text{ kg/m}^2$) and High BMI ($>24.9 \text{ kg/m}^2$) category. The mean of awareness score for Low, Normal and High BMI category were found to be 14.2, 25.8 and 19.6, respectively. A one-way ANOVA (Analysis of Variance) was conducted to compare the mean score among the three groups. Significant effect of BMI status on the awareness of respondents regarding detrimental effect of tobacco (at $p\text{-value} < 0.05$) was found [$F\text{-value} (2,311) = 613.81$, $p\text{-value}=0.001$]. Post hoc comparison using Tuckey HSD test indicated that the mean awareness score for Low BMI status ($M=14.2$, $SD=2.5$), Normal BMI status ($M=25.8$, $SD=2.5$), and High BMI status ($M=19.6$, $SD=1.9$) was significantly different from each other. Hence, hypothesis 3 is accepted.

4. DISCUSSION

The present study highlights certain unexplored areas related to tobacco consumption behavior during pregnancy. About one-third of the respondents reported that they have consumed one or more tobacco products in the past, out of which approximately 31% of the respondent's consumed tobacco during pregnancy. The prevalence is markedly higher than the national prevalence value. The reason behind could be environmental and sociocultural factors as identified by past researcher (Krishnamoorthy and Ganesh, 2020). Ibrahim et al., (2019) reported significant impact of the nature of occupation on tobacco consuming habits.

The present study analyzed the association of tobacco related awareness with identified variables. The awareness was scored and found to be positively associated with mass media exposure. Furthermore, the tobacco consumption by spouse was found to have significant impact on awareness of participants. The present study reported, females with poor BMI have lowest awareness level. The reason behind this could be that the low BMI is often found in poor socioeconomic environment where social taboo like substance abuse, alcoholism, gender biases etc. are prevalent (Kibria et al., 2019; National Family Health Survey- 5, 2019).

Clinical implications of the findings are that, while treating respiratory tract diseases, migration could be considered as a risk factor. Furthermore, the migration status should be captured while recording patient's demographic information. The present study is based on probability sampling; therefore, the findings could be generalized to internal migrant females of India (aged between 15-49 years). However, how the demographic and socioeconomic variables are shaping the tobacco consumption habits of migrant women requires further research.

5. CONCLUSION

The government health agencies should promote mass media campaigns against tobacco use. A social network analysis needs to be done to analyze the role of husbands in imparting tobacco related awareness to wives. Health professionals should educate the women and accompanying family member during antenatal check-up. Dedicated awareness campaign for slum areas could mitigate the situation.

Limitation

Point of contact with women was situated at the USG unit of a hospital. Even though the research team did try to maintain the privacy, few respondents may have altered their responses due to occasional interference of the accompanying family members. Apprehension bias might have occurred in some of the respondents, as tobacco consumption is viewed as a vice act. In future, similar research should be conducted overcoming these limitations.

Ethical consideration

A written informed consent was obtained from all the respondents in the local language in presence of their accompanying family members. In case of an illiterate respondent, verbal consent of the respondent and written consent of the accompanying family member was taken. They were assured of anonymity and confidentiality. The freedom to withdraw from the study at any time

during the interview or examination was also explained prior to taking of the informed consent. During interviews, only the interviewer and the respondent were present in the dedicated space to maintain privacy and confidentiality of the responses. The dedicated space was located adjacent to the patients' waiting areas and for the convenience of respondents; interviews were conducted when the respondents were waiting for their turn. Emergency cases and any woman who was not feeling well, having discomfort or pain was excluded from the study. The study was approved by the Ethics Committee of Al-Barkaat Institute, Aligarh (approval no. IEC/008/2-21/75).

Acknowledgement

We would like to thank JN Medical College administration and Mr. Adil Jawahar (President, Umeed Welfare Foundation) for supporting the project. Special thanks to Mr. Divyansh Sharma (Research Officer, IIHMR University) for assisting us in improving the quality of paper.

Authors' contributions

FA conceptualized the research idea and was in-charge of overall direction. Data collection tool was prepared by FA and KPA. Data collection was done under supervision of FA and KPA. All authors contributed equally to literature review and analysis. Paper writing was done by FA, SM and AAA. Critical inputs were given by SJ.

Funding

This study has not received any external funding.

Conflicts of interest

The authors declare that there are no conflicts of interests.

Data and materials availability

All data associated with this study are present in the paper.

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